

WHAT IS CLAIMED IS:

1. A multi-channel optical switch comprising:

a supporter;

5 an input terminal optical fiber fixed to the supporter
for inputting an optical signal to be switched therethrough;

multiple output terminal optical fibers fixed to the
supporter for outputting the optical signal inputted through
the input terminal optical fiber therethrough;

10 multiple micro mirrors for reflecting the optical signal
inputted through the input terminal optical fiber and then for
directing the optical signal to a designated output terminal
optical fiber among the multiple output terminal optical
fibers; and

15 multiple actuators respectively connected to the micro
mirrors for adjusting the positions of the micro mirrors so
that the optical signal is reflected by the micro mirrors.

2. The multi-channel optical switch as set forth in
20 claim 1, further comprising multiple lenses fixed to the
supporter and respectively separated from the optical fibers
by a designated distance for collimating the optical signal
transmitted and received through the optical fibers so that
the optical signal has uniform optical performance throughout
25 a constant optical path.

3. The multi-channel optical switch as set forth in claim 1, further comprising a housing surrounding an upper portion of the supporter.

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4. The multi-channel optical switch as set forth in claim 1,
wherein the supporter is made of a silicon wafer.

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5. The multi-channel optical switch as set forth in claim 1,
wherein the optical fibers are fixed to the supporter by an epoxy.

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6. The multi-channel optical switch as set forth in claim 2,
wherein the optical fibers and the lenses are fixed to the supporter by an epoxy.

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7. A method for manufacturing a multi-channel optical switch comprising the steps of:

(a) forming grooves for receiving multiple optical fibers, multiple lenses, multiple micro mirrors and multiple actuators in a supporter;

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(b) fixing the lenses, which are polished to adjust

their sizes and incident surfaces, to the supporter;

(c) inserting the optical fibers into the grooves of the supporter, said optical fibers being respectively spaced from the lenses by a designated air gap so that the lenses have
5 uniform optical performance throughout a designated optical path;

(d) finely adjusting the inserted optical fibers, and then fixing the adjusted optical fibers to the supporter; and

(e) arranging the micro mirrors and the actuators at
10 corresponding positions on the supporter so that the optical signal is reflected by the micro mirrors toward a designated channel.

8. The method as set forth in claim 7, further
15 comprising the step of (f) surrounding an upper portion of the supporter with a housing.

9. The method as set forth in claim 7,
wherein the optical fibers and the lenses are fixed to
20 the supporter by an epoxy.

10. An optical collimating apparatus comprising:
a supporter;
optical fibers fixed to the supporter for transmitting
25 and receiving an optical signal; and

lenses fixed to the supporter and respectively separated from the optical fibers by a designated distance for collimating the optical signal transmitted and received through the optical fibers so that the optical signal has uniform optical performance throughout a constant optical path.

11. The optical collimating apparatus as set forth in claim 10, further comprising a housing surrounding an upper portion of the supporter.

12. A method for manufacturing an optical collimating apparatus comprising the steps of:

- (i) forming grooves for receiving optical fibers and lenses in a supporter;
- (ii) fixing the lenses, which are polished to adjust their sizes and incident surfaces, to the supporter;
- (iii) inserting the optical fibers into the grooves of the supporter, said optical fibers being respectively spaced from the lenses by a designated air gap so that the lenses have uniform optical performance throughout a designated optical path; and
- (iv) finely adjusting the inserted optical fibers, and then fixing the adjusted optical fibers to the supporter.

13. The method as set forth in claim 12, further comprising the step of (v) surrounding an upper portion of the supporter with a housing.